SPOTTED FROG POPULATIONS

1997

The following preliminary findings report was submitted by Marc P. Hayes, herpetologist. Final reports will be submitted in Spring 1998.

Summary of the Wood River Spotted Frog Surveys for 1997

During 1997, three two-day surveys were conducted for spotted frogs on the Wood River Property on June 25-26, July 28-30, and August 29. Additional water quality information was gathered on one day in October. The striking feature of these surveys is that the number of amphibians encountered in 1997 was substantially greater than in the two previous years in which surveys were conducted (1994-1995). Overall, the number of observations, when standardized for effort, increased nearly an order of magnitude, largely because of the greatly increased numbers of Pacific chorus frogs observed. The encounter frequencies of the Oregon spotted frogs also increased over two-fold. The western toad data suggest a decline, but erratic localization of reproduction in this species along with abundant sightings by others off the survey paths may indicate that this species also increased, but most individuals were simply missed by our surveys.

Garter snakes did not appear to change significantly in 1997 except that cover levels make capture much more difficult than in previous years. The reason for the significant increase in amphibians in 1997 appears related to the low water levels at which the North Canal and other segments of the canal were held for significant periods in 1997. A similar low water level pattern, brought about by draining in 1996, may have benefitted amphibians in this system. These kind of low water levels likely provide amphibians, including Oregon spotted frog larvae, better refuge from exotic fish predators and more favorable food levels and developmental temperatures.

Evidence of Oregon spotted frog reproduction occurred in three locations on the Wood River property: 1) at the extreme south end of the Wood River canal; 2) in a pool in a ditch across from the leaky headgate along the Wood River canal; and 3) somewhere in the easternmost 200 meters of the North canal. The last two sites were used for reproduction in 1995, but the first site is new. Recruitment appeared significantly greater at the (1) and (2) locations above, probably because cover from fish was more substantial at these two sites and the numbers of fishes were fewer.

The dissolved oxygen at the (1) site was significantly higher than had been in either 1994 or 1995. This may explain the ability of spotted frogs to use the site in 1997 where they had not done so before. The larger numbers Of Oregon spotted frogs actually captured in 1997 permit a much better picture of the size and age structure of the population than was available in previous years. Both June and July samples show two peaks that from left to right represent the 1997 and 1996 cohorts. The July and August samples show a third small peak in the 75-85 mm range that represents the 1995 cohort. The latter was confirmed through the recapture of three females originally captured as 30+ mm juveniles by July and August of 1995 that were recaptured in July and August 1997 in the 75-85 mm range.

This data suggest rapid growth, with males maturing in one year (males are mature at 50 mm), and females maturing in two years (females are maturing around 70 mm). Since oviposition probably occurs in April, males cannot reproduce until their second year, whereas females probably typically reproduce in their second year. An understanding of longevity requires more recaptures, but the lack of frogs over 85 mm implies that most females at Wood River may not live into their third year. This would be a very high turnover rate when compared to that known for other ranid frogs. This has significant conservation implications: if this population has relatively high levels of predation as the data indicate and as a result has high turnover, the population could come close to extirpation after only two consecutive years of changes that promote significantly increased predation. This is an important management consideration because creation of more refuges for adult Oregon spotted frogs may reduce turnover, increase longevity, and buffer against catastrophic change. Fortunately, having held the water levels low in selected areas (e.g. North Canal) for significant intervals in 1997 and 1996 as well, appears to have favored recruitment and survivorship.

As a consequence, management should consider that the Oregon spotted frog would benefit from such manipulation of water levels that synchronize with the spotted frog's active reproductive periods. Creation of the ponds on the north end of the property is likely to have a positive effect because a significant area was designed for shallow water bathymetry. If these areas develop the floating, submergent, and low emergent vegetation that favors adult Oregon spotted frogs, the population may be enhanced. Predicting such an effect is risky because some of the aquatic structure may favor exotic fish. Keeping low water levels in the ponds early in the season is likely to favor recruitment in the Oregon Spotted frog and other amphibians and disfavor exotic fishes. Subsequent slow raising of water levels as the season advances will probably increase refuge area and food levels for more advanced life stages. While this scenario seems likely, it contains certain elements of unpredictability, so it should be viewed as experimental. In the latter context, some kind of monitoring should be implemented to determine the actual consequence of these manipulations.

Some amphibian species at Wood River are rarely observed (long-toed salamander, western toad) either because their populations may be limited or they display erratic, unpredictable reproduction. It will be of special interest to determine whether pond creation and the water management favor these species in a manner in which they can be observed more frequently in a more predictable way.

1998

Surveys

Amphibian surveys, primarily focused on the Oregon Spotted frog population, were conducted as part of an ongoing effort to monitor changes in population size and distribution as restoration of interior wetland habitat proceeds. Surveys were conducted on four different days between July 16 and August 8, 1998. A total of 50 spotted frogs were captured, measured, and released. An additional 56 spotted frogs were observed but not captured.

Spotted frogs were found only in areas known to have had strong breeding populations during past survey years. These include the entire length of the North canal, the East canal along the Wood River, and the small channel just west of the East canal. Additional areas that were considered suitable

habitat were surveyed, including several of the north/south running interior ditches. No spotted frogs were observed in these areas. Preliminary water quality measurements indicate that current spotted frog distribution may be limited by water quality in the interior marsh. Temperature and dissolved oxygen were measured at 8 micro habitats where spotted frogs were observed basking. Dissolved oxygen ranged from 7.27 mg/l to 10.36 mg/l. Temperature ranged from 19.6 to 27.09 Celsius. Spotted frog density appeared to decrease in all cases as distance from the Wood River source increased. Spotted frog density appeared to decrease in all cases as distance from the Wood River source increased. Spotted frogs were observed only in areas that receive varying amounts of perennial flow.

Of particular interest in this year's survey results were the apparent shift in previous size frequency distributions from a predominantly juvenile age structure to one dominated by adults and sub-adults (84% adult/sub-adult). It should be noted that there were significantly fewer juvenile spotted frogs observed in 1998 than in previous years whereas a similar number of adults per unit of survey effort were observed. During the 1997 survey, 59 frogs were tagged with PIT (passive induced transponder) tags. Of the 42 adult/sub-adults captured during 1998, four had been previously tagged. An analysis of these frogs movements from their 1997 location is currently being conducted. No new PIT tags were placed in 1998. A one day survey effort on May 17th confirmed the fact that spotted frogs were still occupying the locations described by Hayes. Newly available habitat was surveyed by canoe, but no frogs were observed.